

The Far Call

The Phenomenal Success of the Amateur Trans-Atlantic Tests

By Paul F. Godley

ON its editorial page of November 30, 1921, The Star (London), published an article which was intended to inform the public of Great Britain on "the prospects of the new trans-Atlantic wireless tests." The author of this article showed a decided satirical vein and took advantage of a great opportunity to poke fun at American amateur radio phraseology. Further, and "with all due respect," he issued an invitation to America's "'ardest of 'ard boiled 'ams'" to avoid the use of regenerative receivers (when improperly de-

signed and carelessly used they act as miniature transmitters) so that the British amateurs might have a chance of hearing something, too.



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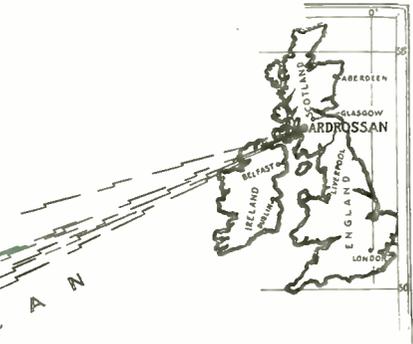
These tests were a phenomenal success. The radio world was startled, pleased. Amateurs on both sides of the water are proud of their successful efforts which have been duplicated since. In view of what transpired I am sure that the author of the article mentioned above would now join me in registering amusement at his earlier efforts. But, he performed for me a service. The title of his article was "The Far Call." To me, those words are filled with romance — the romance of strange, fascinating, delightful adventure; a vision of the spirit of youth, vital eagerness, far-darting imagination. and. I ask you, where is there

the man who breathes whose intelligence is not held fascinated by speculation upon the limits to which amateur radio signals may be sent? There are in America 20,000 radio amateurs whose interest in the transmission of small radio signals over greater and greater distances transcends all else. Scattered over the entire land, they continually relay messages from the Atlantic to the Pacific — from Canadian cities to the Mexican border, and, exchange greetings direct between New York, Boston and the Pacific Coast, Montreal and El Paso, Minneapolis and New Orleans;

thousands of them, wide awake at 2 a. m., proficient amateur engineers seeking new worlds to conquer. These men held a convention—the First National Convention of the American Radio Relay League—to which delegates were sent from every section on the continent. Here took place organization meetings, technical meetings, inspection of amateur stations in Chicago — the convention city — exchange of ideas, great displays of equipment, but the biggest thing that came out of that convention was the expression of a desire to register American amateur radio signals in Europe and the determination to do it. The co-operation of British amateurs was to be enlisted, and money was appropriated to send a "hard boiled American ham" and American amateur equipment to Europe by way of insurance that it would be done if it were possible. Greatly honored, it was my good fortune to be chosen as that man. This is a story of my adventures.

After exchange of telegrams between my home and the convention above referred to, there ensued long consideration of methods and equipment, study of maps and globes and

search for information concerning the difficulties to be encountered. Communication was had with our Department of State, and with Mr. P. R. Coursey, Editor of Wireless World (London), who represented the British amateurs. Arrangements were made for a British Post Office permit of operation, and for transportation.



and plans were made for the daily report of results at the receiving end via the high power stations of the Marconi Company (England) and the Radio Corporation of America. Equipment borrowed from our best manufacturers was laid out and set up for a thorough tryout.

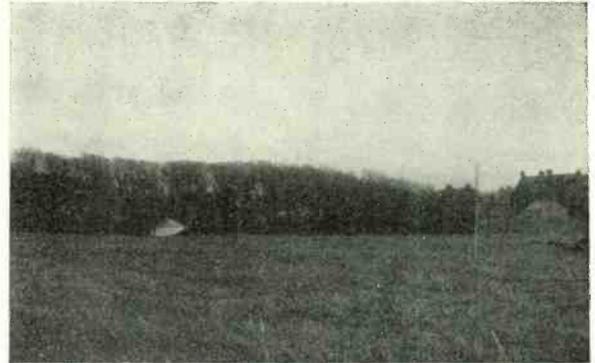
On November 1 the preliminary tests, which all were invited to enter, began, and the entrants transmitted on schedule each night up to November 5 in an effort to cover a distance of 1,000 miles overland, failing which they were to be disqualified for participation in the main event. All my equipment was set for action, the super-heterodyne receiver being fed by a three-foot loop antenna. And what interest there was: Seventy-eight star stations scattered through every radio district, worked to schedule with clock-like precision. Station 5ZA in Roswell, New Mexico, consistently pounded in night after night on a four-ohm telegraph sounder by virtue of relays in the circuit. Those were the first thrills.

Then came the night of November 14 with a farewell dinner and with all arrangements completed I sailed for England. Twenty-five contestants had qualified—two more were added later. The ten test nights—December 7 to 16, inclusive—had been divided into two periods, 7 P. M. to 9.30 P. M. Eastern Standard Time, and 9.30 P. M. to 1.00 a. m. The first half of the night was intended as a free-for-all and was divided up into 15-



Courtesy A. R. R. L.

Apparatus in tent at Ardrossan. Note the lantern (upper left) the heating plant consisting of a small oil stove (bottom center) and the thermos bottle (lower right)



Courtesy A. R. R. L.

Location of tent and a view of one end of the antenna which was 1300 feet long

minute periods, one period being assigned to each of the nine American inspection districts and one to the Canadian stations. These periods were rotated each night, so that if there was a better chance at one hour than another all districts would have a shot at it. The second half of the night, from 9.30 P. M. until 1 A. M., was assigned to those individual stations which had qualified in the preliminaries. The time was divided into fourteen periods of 15 minutes each, and during each of these periods only individual stations were to transmit. Two stations were assigned to most periods, although some periods found three stations transmitting, care being taken that the stations were well separated, and their wavelengths about the same to obviate too much adjustment on the receiving end. A secret code word of five letters was assigned to each of the stations which had qualified, with instructions not to open the letter containing the code word until the first night of transmission. A copy of these code letters was handed to me in a sealed package for delivery to Mr. P. R. Coursey in England, who was to be referee throughout the tests, and to whom I was to make all reports of reception in the same manner as did the British amateurs, although, in case of my reports, Coursey was to send them off to the States via the Marconi Station MUU, Carnarvon, Wales, from which station they were

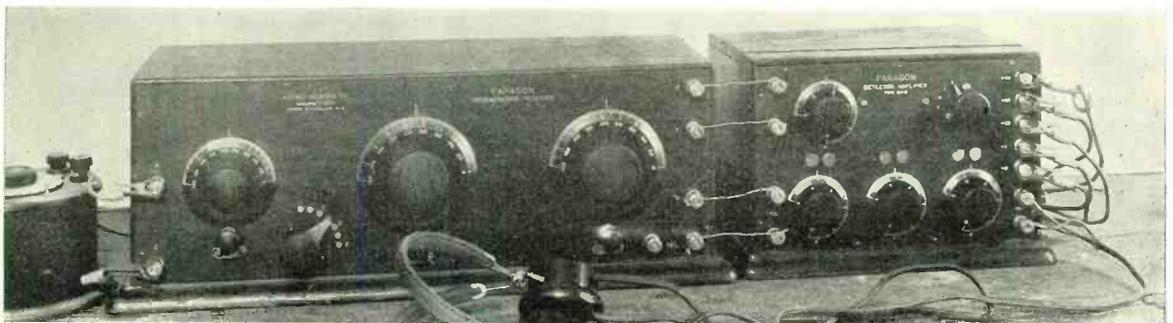
to be slowly broadcast so that American amateurs might hear, after which the Radio Corporation station WII at New Brunswick, N. J., was to slowly repeat them for the benefit of those amateurs having less sensitive receivers.

It was quite apparent that both amateur and professional interest in this great sporting event was running high. The great commercial trans-Atlantic stations were placed at our disposal each morning during the period of the tests through the efforts of Mr. W. A. Winterbottom, Traffic Manager of the Radio Corporation of America. At least a dozen engineers had come forward with offers of assistance. Both Mr. Winterbottom and Mr. E. E. Bucher had given me letters of introduction to the principals of the Marconi Wireless Telegraph Co., Ltd., in England, and had written these men outlining the project and soliciting their assistance. The Radio Corporation had also loaned equipment in the shape of UV-200 detector tubes. Baldwin phones were also included and later proved their worth. Burgess batteries, a General Radio Precision wavemeter, A-P amplifier tubes, and Paragon receiving tuners and amplifiers were all within the trunks on the dock on the night of November 14, at which time a group of prominent amateurs were welcoming me to a very enjoyable informal dinner at the Engineers' Club, New

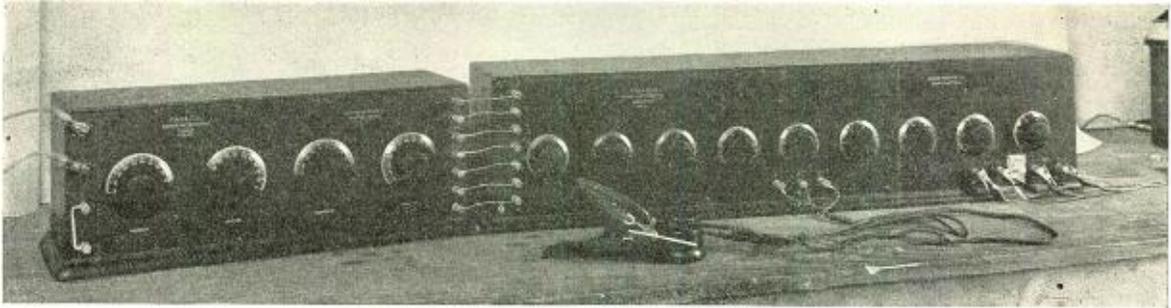
York City, in order that they might offer every encouragement and bid me God-speed.

I shall never forget that night. There were present Messrs. Maxim, Warner, Schnell, Hebert, Camp, Stewart, Service and Goette, all officers and members of the Board of Direction of the American Radio Relay League; Mr. J. Andrew White, Editor of *THE WIRELESS AGE*; Edwin H. Armstrong, G. H. Burghard, President of Radio Club of America; P. H. Boucheron, Director of Publicity, Radio Corporation of America, and W. S. Smith of the Hartford (Conn.) Courant. This affair was a regular old-time get-together and I was having a great time until someone started on a line of talk which ended up with Armstrong's telling the bunch that he would stake his professional reputation on my success, and with White's assurances to all assembled that there was nothing to it—it was a cinch. I wasn't so all-fired sure about it, and I began having visions of coming back to the States to find a nice little hole to crawl into and pulling it in after me.

At noon on the following day the "Aquitania" slid down the North River and I was off. Prior to sailing, the vessel and the dock had been swarmed by a group of very earnest amateurs who had come to bid me farewell. After these men were put ashore we had great fun signaling back



A view of the special regenerative receiver hooked up with a detector and two-step amplifier



Front view showing the control dials of the super-heterodyne tuner and amplifier

and forth through the din and confusion, and it was in this way that I learned that H. H. Beverage, receiving engineer for the Radio Corporation, was aboard, and I met him for the first time as he leaned over the rail and the "gang" on the dock looked on.

During the voyage across, what time was not spent sleeping, found me either talking to Beverage or in the radio room, which had been thrown open to me as a result of the courtesy of Mr. H. H. Short, Superintendent Marconi International Marine Communication Co., Ltd. It was impossible to do a great deal of listening on the short wavelengths on account of the large amount of radio traffic handled by the bigger vessels, so I had to be satisfied with occasional snatches of 200-meter stuff and the many radiograms which came in via the commercial stations wishing me bon voyage and all success. Those radiograms certainly put it up to me to make good. One from the editor of this magazine read: "Just an added slap on the back, old man, to emphasize my sincerest wish that this trip of yours will go down in radio history," while one from the officers of the American Radio Relay League read: "Bon Voyage: The entire radio world is pulling for you." This was to be no lark! It would never do for me to disappoint that enthusiastic crew of radio men back there. There was only one course open to me — that was the course which, beyond all peradventure of a doubt, would bring in signals, and I

began to retrace plans, to amend here and add there.

Even European amateurs were all wound up on this thing, too. In reply to a radiogram of greeting to a prominent French amateur came: "Wish you complete success," and when I reached the dock in Southampton I found there waiting to assist me through the customs, Mr. H. J. Tattersall, Superintendent of the Marconi Company in Southampton. The same interest was shown in London when I arrived. I was introduced to all the prominent radio men thereabouts before forty-eight hours had elapsed; had spoken briefly before the Wireless Society of London; had had a mixed debate with regard to the amateur policy of the British Post Office; had listened to an extremely interesting lecture given by Dr. J. A. Fleming before the Royal Society of Arts, and had chatted with such men as Senatore Marconi, Admiral Sir Henry Jackson, President-elect of the Wireless Society of London; Mr. Campbell-Swinton, past president of the society; Prof. E. W. O. Howe, Mr. E. K. Shaughnessy, Chief Engineer, Wireless Section of the British Post Office; Mr. F. Hope-Jones, Chairman of the Wireless Society of London, and many others.

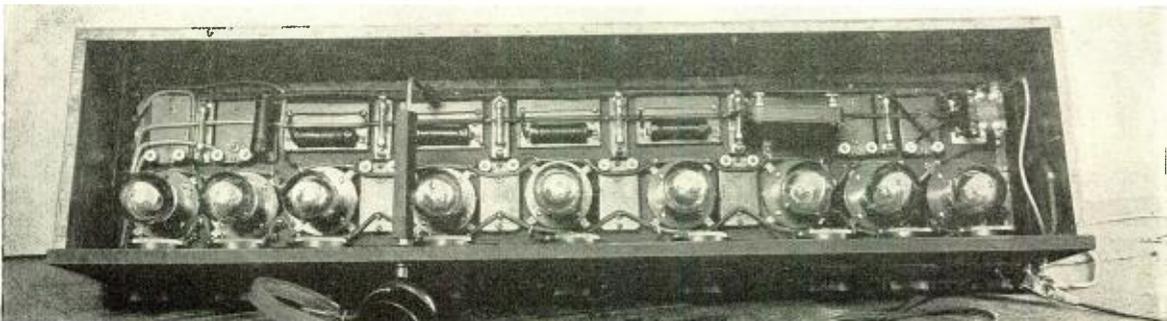
It was at the close of Dr. Fleming's lecture that I met Senatore Guglielmo Marconi. I was greatly pleased at the interest which he showed in the tests which were about to be carried out. He asked many questions concerning my plans and concerning ama-

teur and broadcasting progress in the U. S. A. He expressed every hope that the tests would be successful, and said he saw no reason why they should not be. As I was about to leave him, he asked that I carry back to the amateurs in the United States his good wishes, because, as he said: "You know, I too, am but an amateur."

After this conversation with Senatore Marconi, I was entertained at a little informal dinner in a brilliantly lighted restaurant on the Strand, and everyone present, including two ladies who were qualified as amateurs, toasted the success of the amateur trans-Atlantic tests.

Notwithstanding the wonderful hospitality, I am quite sure there wasn't one of them who thought that we had a chance of putting the thing over. I am also sure that many of them had great difficulty in figuring out how any group of men could take so keen an interest in such a thing as this — an interest which would lead them to spend good time and good money in an effort to carry through such experiments. But they were good sports, because they did their share in every possible way, and if they did finally come to the conclusion that there were possibilities of success, I believe that it was due, in large measure, to the great efforts which they saw had been made by all concerned on this side. And I think they surprised themselves a bit, too, when British amateurs copied at least nine American stations.

There are, in Great Britain, approximately, 5,000 amateurs interested in



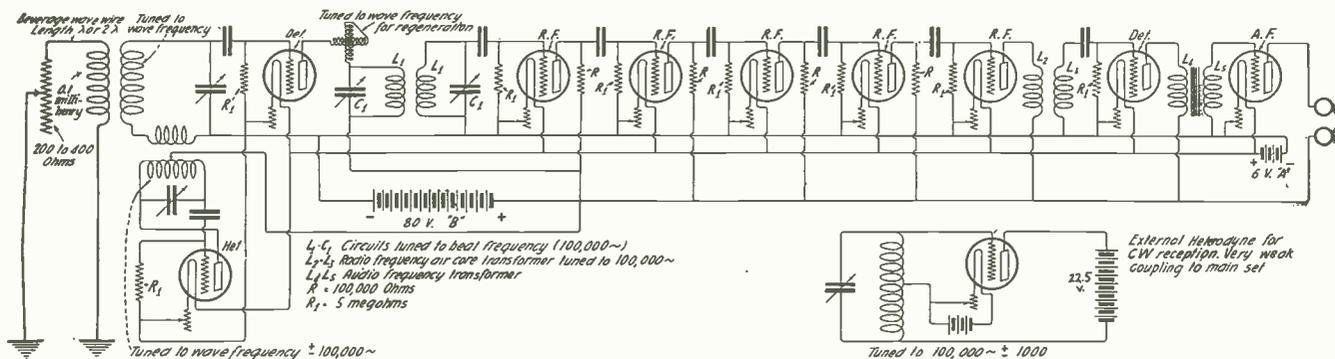
Interior view of the super-heterodyne tuner and amplifier showing the arrangement and construction of the apparatus that make up the set

radio. A great number of these operate receiving and transmitting apparatus. There is, however, no relay work going on. The British Post Office regulations prohibit it. The Post Office officials hold that to permit it would cause a decrease in the revenues which accrue from the telegraphs. The attitude of the general public in Great Britain and the misconceptions under which they are laboring, is very well illustrated by a lengthy editorial which appeared in

very long distances even with "spark" transmission, and is not much less powerful than the gear in use at some of our coastal stations. If amateurs in this country were allowed to use power up to a kilowatt, the whole position of British commercial wireless would be greatly compromised and a good deal of the apparatus and machinery which the Post Office has, under considerable financial restrictions, installed since the 'Armistice would probably have to be scrapped in order

interfering with "SOS" calls, I wish to go back and straighten these newspaper editors out on the thing. They're all wrong as we well know, and in a year or two they will know it, too, but under the circumstances, the British amateur has a stiff climb ahead of him.

Among those who were first to greet me in London was P. R. Coursey, Editor of the "Wireless World," and Commander Frank Phillips, Radio Engineer and prominent in amateur cir-



The super-heterodyne circuit diagram and some values used in the set at Ardrossan

the Glasgow Herald on the morning of the day when I sailed for home. In part, it reads:

"The position of the wireless amateur in this country has been sharply accentuated by the visit of Mr. Godley, the representative of the American amateurs, who has been carrying out trans-Atlantic low-power wireless tests at Ardrossan. Mr. Godley came over here with a specially sensitive receiving instrument which it was anticipated might record even messages transmitted from American private stations, the power of which is restricted to one kilowatt. The anticipation was realized, messages having been duly taken in from over 30 different amateur stations in the United States and Canada. This is a very remarkable achievement, which certainly does, in a way, open up a very alluring prospect of regular wireless intercommunication between British and American amateurs. But a great many changes will have to take place before the prospect is anything but remote. The position of the wireless amateur in America is altogether different from that of his British confrere. He is, for example, just a hundred times better off in regard to power, since our Post Office at present only grants licenses to use power up to ten watts, and ordinarily the use of an amateur transmitting station "on this side" is restricted to a radius of ten miles. The one kilowatt set, with which American amateurs are privileged to work, is capable, under every-day conditions, of covering

to provide gear capable of effectually dominating amateur "interference."

"America, no doubt, knows her own business best in regard to wireless. It is undoubtedly an interesting, and possibly beneficial circumstance that American amateurs can freely communicate with one another, and listen to concerts and speeches delivered perhaps some hundreds of miles away. But what is good for America is not necessarily good for us, and we must not blame our Post Office if it exercises very great caution indeed, in following the American Government's example in extending amateur wireless facilities. The post master general in this connection acts as trustee for the public and his responsibility is three-fold. First, he must see to it that the efficiency of his own wireless service is not in any way compromised by amateur interference; secondly, he has to consider the case of the various ship and commercial stations to which he grants licenses; thirdly, there is no getting over the fact that wireless is at present a valuable government monopoly, which, in the near future, will probably be developed to a very high pitch of revenue earning capacity. As a nation we can ill afford the marked depreciation of the income to be derived from telegraphy, both with and without wires, which will inevitably ensue if British wireless amateurs obtain all the facilities enjoyed by the same class in America without official let or hindrance."

They think a great deal more than they say, too. They even accuse us of

cles. Coursey had already arranged for a permit for operation, and this permit restricted me to the home station of Mr. Phillips. As soon as I could get my bearings, all equipment was taken to Mr. Phillips' home, set up, and put into operation.

We American amateurs have seen and read a great deal that has been written in the British Radio magazines concerning those obnoxious ones who insist on allowing their regenerative receivers to oscillate. Until I had listened in near London on some of the 10-watt radiophone "concerts" I never before fully appreciated the meaning of the phrase "radio concerts." Then I knew. A radio concert near London is a concert of listeners, all listening to the same 10-watt radiophone about 40 miles away, and all allowing their receivers to operate on or near the zero beat. That is, their receivers were oscillating, and what one heard instead of the phone was about fifteen or twenty faint flute-like notes, each of a different pitch. It is needless to point out that this entirely spoiled, in most cases, the speech or the music, and this was usually true during the musical programs sent out by a Dutch Radio Company at the Hague on Sunday afternoons. We, here in America, are beginning to get that, too, particularly those of us who live in the congested areas, and I have been speculating for many months on how far those types of receivers which do radiate considerable amounts of energy when allowed to oscillate will offset the value of the radiophone con-

certs in these congested districts remote from the source of the concert, and how soon it will be found necessary (if we are to get the most out of the broadcasting programs), for steps to be taken to put a stop to the thing.

During my entire first visit to London, the fog was so thick that it could be cut with a knife. You, no doubt, have heard of the "pea-soup" fogs. They originate in London, and I was forcibly fed on one for about 10 days. And that reminds me of a conversation which I listened in on while at Wembley Park, which took place between the operator at the Croyden air-drome and one of the London-to-Paris planes. The plane was in-bound. The fog was thick. The pilot's name was Robinson, and he was very keen on landing at Croyden notwithstanding that orders had been passed out to him earlier to land at a point some 25 miles south of London. The conversation ran something like this:

"'Allo R-r-r-r-robbie; Cr-r-r-roymden callin'; 'Allo R-r-r-r-robbie; Cr-r-r-r-roymden callin' and s-v-itchin' over."

"'Allo Cr-r-r-r-roymden; 'allo Cr-r-r-roymden; I expect to land at Cr-r-r-roymden; R-r-r-r-robbie s-v-itchin' off."

"'Allo R-r-r-r-robbie; 'allo R-r-r-robbie; Cr-r-r-roymden here; you are positively forbidden to land at Cr-r-r-roymden; you are positively forbidden to land at Cr-r-r-roymden; Cr-r-r-roymden s-v-itchin' off."

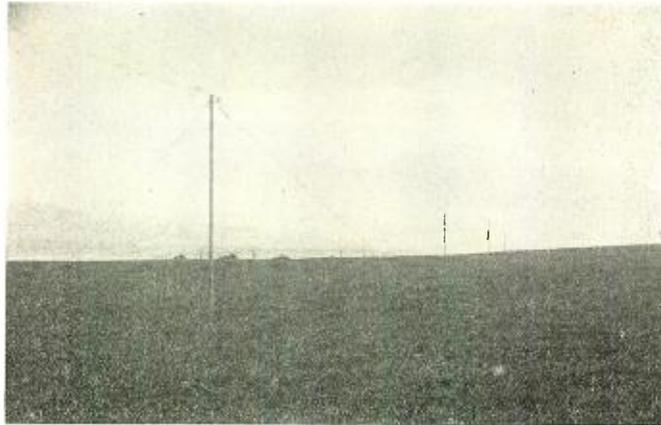
Apparently Robbie was a daredevil. He did land at Croyden.

After a little of this radiophone stuff and listening in on various wavelengths to all the strange commercial station calls up and down the European shores, we settled down onto 200 meters to see what it was like. And what do you suppose we found. Static! Gobs. and gobs of it. And harmonics,

wheezing away. Through five nights of this we sat and listened—or rather Phillips sat, and I stood and listened and shivered, with a gas fire going full tilt in the fire place, and never a peep from the U. S. A. Phillips took quite a fancy to the receivers, but carried a knowing smile which meant to me "Well, old top, you'll learn something about what we were up against during the last tests."

And, too, I had a feeling that if worst came to worst, rather than face the London crowd again, I could jump right off the Scottish shore and swim back, land in Newark bay, and slink across the Jersey meadows in the dark of the night.

On the other hand, I disliked to run away from Coursey, Phillips et al. In their place, I think I would have been somewhat disappointed. We had



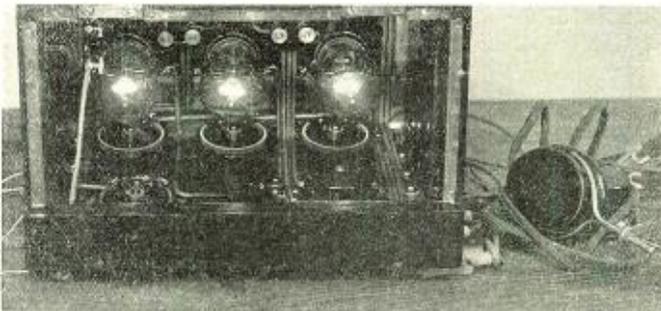
Courtesy A. R. R. L.
A perspective view of the extensive antenna and surrounding flat country

I must confess, frankly, that I wasn't at that time very much in love with the job ahead of me. I was worried — and deucedly cold besides, and the only way I could jolly myself along was to paint mental pictures of a beautiful flat of land by the sea on the Scottish coast in one corner of which stood a cozy little cottage all nice and warm inside; a long table in one room which faced the West; and a beautiful view, through the window, of the sea-side flat across which stretched a business-like Beverage Antenna. And, I carried this picture

planned that various amateurs in the London area would sit in with me during the several nights, and I'm sure I missed a great deal. But signals were the thing, and all manner of fellowship could never, never make up for the lack of them.

After negotiations, which required some effort with the British Post Office, regarding an alteration of the operating permit to cover some location within a radius of 40 miles of Glasgow, it was granted. It is likely that the hesitation shown was due to the unwillingness on the part of Post Office officials to weaken their position with regard to amateurs. Any favors shown me would most certainly encourage British amateurs to ask greater leeway. Any success which I might have would most certainly encourage British amateurs to present a bolder front than at any time in the past. But, knowing this, and thinking as they do that amateurs should have no place under the sun, still permits were granted. If a certain honorable gentleman, Mr. J. W. Wissenden by name, and who is by occupation assistant secretary to the Post Master General, ever puts in an appearance in the States, and I learn of it, I shall see to it that he gets a permit to do anything he wishes, 'Antis notwithstanding.

Before leaving for Scotland conferences were held with Coursey, which covered methods of reports to him and his dispatch of them via MUJU. This brought us in touch with Mr. Otto Rochs, Traffic Manager, Marconi's



Interior view of the detector and two-step amplifier showing the UV-200 and 201 Radiotron tubes

whole orchestras of them! Home was never like this. One could read nearly all the high-power stations in Europe on or near two hundred meters. There was POZ, Nauen; FL, Eiffle Tower, Paris, MPD, Poldhu, England;—all the high-power stations in Christendom whistling and bubbling and

around with me until, finally, there was nothing left for me to do but go and look for the original. Anything was better than being forced to live through the days and nights with a feeling that it would be the same old story of static and harmonics, harmonics and static, over and over again.

Wireless Tel. Co., Ltd., who held that there was nothing connected with his service too good for amateurs, and his performance was entirely in accord with his views. There were others working for us, too. Arrangements were made from London with the Marconi Co. for the use of materials, men and the company's motor truck in Glasgow if this were needed. This assistance was not solicited and came as a result of the keen interest taken in the whole scheme by Mr. W. W. Bradfield and Mr. Allen, joint general managers of Marconi's Wireless Tel. Co. About this time I also met Mr. H. J. Round, Marconi Receiving Engineer, whose contributions to the art are familiar to all amateurs. He, too, was keenly interested not only in the trans-Atlantic tests, but in everything that we are doing on this side, and I took advantage of him to the extent of learning all I could from him.

The night of December 1 found me aboard train and off for Aberdeen on a little side trip which it was hoped would bring to light first-hand information concerning the reported reception at that point of station 2QR. For the first time since reaching England I was cozy and comfortably tucked away in the berth of a first-class sleeper on a through express. The compartment was steam heated, and things were so arranged that one could lie in bed and turn steam on or off (I left it on), open or close ventilators, start an electric fan, ring for porter or take a drink, and in the morning a tray containing tea and biscuits was brought in. Home was never like that either. And, what a sad contrast between the comforts on this train and what was to come!

After spending a little time in Aberdeen, which, by the way, is the most beautiful city I ever hope to see, I booked passage to Glasgow, where I arrived Saturday evening, December 3. I greatly missed the berth in the first-class express and made great haste to get into flannels and between the covers in a heatless room, while on the following morning I toured the hotel in search of a fire and found one — just one — which was in an open grate in the lounge room. To this I stuck as closely as possible until Monday morning.

Information gathered in Glasgow concerning the layout in the coastal towns and Ardrossan in particular completely dispelled the cozy cottage part of my idealistic picture. There was no way out of it, so arrangements were quickly made for shipment of a 12 by 18-foot tent by express train, while through the efforts of Messrs. Carswell and Sutherland of the Marconi Marine Communication Company wire, insulators, storage cells, etc.,

were lined up and started on their way. Arrangements were also made to secure the services of the checking operator, Mr. D. E. Pearson, Chief Inspector of this company in the Glasgow district. Both Carswell and Sutherland took great interest in the little game I was to play, and without their assistance I might well have had a different tale to tell. Carswell lined me up with the town clerk in Ardrossan, a Mr. Wood, who was a personal friend of his, while Wood, together with Carswell who joined me in Ardrossan on the following day, saw to it that I got started properly with the city officials who vise-ed my credentials. Both Carswell and Wood spent the greater part of the day in helping me locate the station site. Pearson joined us after lunch, and trunks, tenting, and various other material having arrived on schedule, construction of the station began by mid-afternoon on Tuesday the 6th, with prospects of having it in operation by midnight. The weather, however, was all of the wrong sort. The selection of the site, the transportation of the material to the site, and the erection of tent and antenna were all accomplished amid a downpour of rain. By the time the tent went into position darkness had fallen, and the tent had not been in position many minutes ere a great gust of wind had flattened it and also our spirits. The weather and the darkness finally beat us, forcing an abandonment of the work until the following day. Two hours and twenty minutes of listening in that night — the first of the tests — was effected by using a Western Electric "peanut" tube supplied by Burgess batteries both on the plate and filament. Nothing was heard but static and ship stations, though we listened in on shorter wavelengths.

On Wednesday the 7th, the 1300-foot stretch of line was completed, the wire being supported by 2 x 4 inch posts 12 feet high, and laid out to point directly toward Chicago. The wire was grounded at the distant end through a non-inductive resistance (250 to 400 ohms) and at the home end through a variable inductance of the order of 0.1MH in value. This constitutes the Beverage antenna. For any given wavelength the wire should be one, or two even wavelengths long. Arrangements were made to change the length of the wire, it being necessary in each case to shift the non-inductive resistance and ground connection from one supporting pole to another. Signal potentials built up in such a wire are approximately equivalent to those which would be built up in a vertical wire one-tenth (at most) of its total length. When working at 200 meters and having a wire length of approximately 650 feet (one wave-

length), signal potentials produced in the wire would be equivalent to those produced in a vertical wire 65 feet in height, or, if the full wire were used, 130 feet in height, at that wavelength. Furthermore, the system is highly directional, and eliminates a great portion of the atmospheric and interference coming from directions other than those from which one wishes to receive. That this condition did exist was proven frequently by comparison with a small vertical wire supported by a nearby tree. Static to signal ratio in all cases was decidedly better on the Beverage wire.

Within the tent the regenerative receiver and super-heterodyne receiver were set up together with all accessories which were found to be in first-class condition. Circuit diagrams and photographs of this equipment accompany this article. Reference to the regenerative receiver circuit is unnecessary inasmuch as it is familiar to the great majority of all amateurs, while the circuit diagram of the super-heterodyne is self-explanatory insofar as constants of the circuit are concerned. For a discussion of the action of the super-heterodyne receiver the reader is referred to previous articles by the writer which have been published in THE WIRELESS AGE.

At 11.30 P. M. all outside work had been completed and equipment arranged inside, whereupon the apparatus was gone over and put into operation. First the radio-frequency amplifier used with the super-heterodyne receiver was started up and time signals heard, without antenna, from both FL, Eiffle Tower, Paris, and POZ, Nauen, Germany. Next, the tuning equipment, which formed the super-heterodyne, was gone over in connection with a short wire which had been thrown into a nearby tree, and all circuits were adjusted while working on the multitude of 600 meter signals which were coming through. VCE, Cape Race, was there, and most as strong as any of them, and I took this as a good omen. Finally, the Beverage wire was thrown in, preliminary adjustments made at both ends of the wire, and tuning started, the first signals recorded being the host of harmonics from the high-power stations, although these were not as bothersome as was the case near London. Search for short-wave amateur signals began at 1 A. M.

Exactly 33 minutes later the universe cracked wide open! In one magic moment Scotland's erstwhile gloomy shores became a haven of rest! Muscle soreness, soul sourness, fatigue and doubt vanished, and my unexpectedly difficult but insistent duty became a joy forever! Cold rains then were as liquid sunshine: boisterous, cutting winds as balmy, heaven-sent

breezes. Nothing in the whole sad world could possibly be wrong — nothing, for an American amateur signal was piling in on us and rising in strength until at 1.42, in a very positive manner, his 60-cycle synchronous spark spelled out a message to someone that he would “see him later” and plastered the call letters 1AAW where the whole world might read!

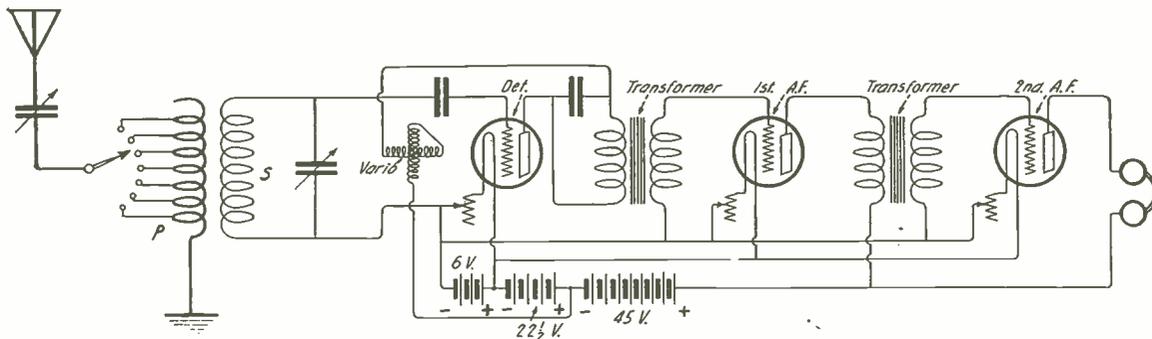
Perhaps it was well that something happened shortly which allowed the charges to “leak off our grids.” I had great difficulty in retaining composure.

League brings to light the information that someone in the Boston district has been using that call. Whoever he is, I hope that sometime he may find courage enough to come forward and admit it. It's a serious offense to appropriate a call and operate in violation of the law, but I would like to shake that fellow by the hand, regardless.

After a good long sleep which was split up, due to the necessity of properly repairing the line during the afternoon of the 8th of December, we got out to find the heavens filled with

various adjustments of both the apparatus and the line wire. During the adjustments we lost 1BCG several times. These adjustments were terminated at 1.33 A. M. and we began logging him. He called “PF” several times, his sending being very steady, but fading out for 30 seconds every three or four minutes. At 1.59 A. M. he called station 2BGM, said “Phone us now” and shut off.

This was the real stuff! No funny business here at all, and for a second time I ran the gauntlet of a whole



Circuit diagram of the special regenerative receiver and detector with two steps of amplification

The lid was due to come off! After “camping” on this fellow’s wavelength he came in again at 1.50, but was too weak at that time to be read through the heavy static, and having heard no more of him up to 2.35, I began to smell a rat, ran down to look over the line, and returned in a few minutes to report a pole broken off short, a couple of others badly out of line and the wire on the ground at a point about 700 feet from the tent. We shut down, grabbed pick and shovel, and mushed out into the tempest to repair the damage. Thirty-five minutes later we had shaken off as much of the slime as possible and were back on the job. Atmospherics were coming heavier, and nothing more was heard of amateur signals, although Cape Race was buzzing merrily away as we shut down at 6 A. M. But, I had no complaints. Twenty-one consecutive hours’ work, no matter what the conditions, or when, or where, can ever again bring to me the supreme satisfaction that came then.

The strange, and, I should say, even sad sequel to this wonderful good fortune runs as follows: Due to error in the use of codes between Coursey and myself, station 1AAW was broadcasted to the U. S. A. as being 1AAY. This was not straightened out until 48 hours had elapsed, and, after being straightened out, it was found impossible to locate the sender. Station 1AAW in Roxbury, Mass., had not been in operation for some time, although investigation on the part of the officers of the American Radio Relay

stars and a bright moon shining. There had been high south-westerly winds during the day with plenty of rain, but now the wind had shifted to the north-west. After two or three hours of listening without further result, we were forced, due to the cold, to make a shift in the arrangement of the equipment in order that we might take full advantage of the heat which our tiny oil stove threw out. Fortunately there was enough canvas left over from putting the tent together to make it possible for us to get a long strip of canvas at our backs, thus pretty well shutting us into one corner of the tent. At this time we also rigged up our lantern so that greater advantage might be taken of its poor light. Subsequent to the changes another two and a half hours of listening brought continued lack of results, and it was necessary to report “no signals.”

On the night of December 9 the weather had again gone very wet, and the winds had grown considerably heavier. Atmospherics were also heavier than the night before, being of about the same order as on the night when 1AAW was heard. At 12.50 A. M. on the morning of the 10th, after listening for sparks, we switched over for continuous wave reception and immediately picked up station 1BCG on 230 meters. We had some difficulty with him due to atmospherics and a very bothersome harmonic from the station at Clifden, Ireland, 150 miles away. Both these were nullified to a great extent by

colony of real thrills. Some radio history was being written in that miserable tent. Oh! how I wished for a transmitter, with which to make more of it!

Nothing further was heard of 1BCG this night. We shut down at 6 A. M. and talked it over. Signals had been so steady and so seemingly dependable that both Pearson and I wondered what power he might be using. Pearson was quite sure it must be several kilowatts, and I couldn't say no. Subsequently we learned that the input was 990 watts.

At 7 A. M. we, for the first time, listened in on MUU as he sent “Godley’s message” through. That was indeed a pleasurable 10 minutes, for as I listened I pictured the thousands of eager listeners on “the other side” to whom these radioed reports would bring increased enthusiasm for this most wonderful game.

Failure to hear stations other than 1BCG on this night coupled with the great strength and steadiness of his signals brought about a lot of speculation on my part as to whether he was to be the only reliable signal to get through to us, and I concluded that he might very well be, so, I cabled him: “Send messages.” This cablegram was horribly mutilated enroute. It reached Armstrong reading “Send mges.” He took this to be some sort of a code word which I wished him to transmit in order that the British amateurs might be convinced that I didn't have a transmitter hidden somewhere on my person, and feeling

that they should be shown he transmitted "MGES," and did it the whole night—or rather morning of the 11th.

His action, however, enabled further adjustments on the Beverage wire, which, taken with the conditions which prevailed, made of the expedition a *real* success, for on this night 18 different stations were logged, the secret code words being gotten from three of them, while dozens more were heard but not logged, either due to our inability to make out their weak signals through static—because of the number of stations working at one time and the resultant jamming—or because of the failure of stations, working locally, to use their station calls when transmission was ended.

The stations heard Dec. 10-11 follow: 1RU sending "BPUSC"; 2FP, "HUZXJ"; 2BML, "FSXVG"; also 1ARY, 1BCG, 1BDT, 1BGF, 1YK, 1XM, 2FD, 2EH, 8ACF, 8XV, all of which were continuous wave stations, and: 1ARY, 1BDT, 2BK, 2DN, 3BP (Canadian), which were spark stations. Although we were unable to get his sign on account of jamming, 9ZJ came rolling through in good style as he worked 2EH.

The most remarkable feature was the strength of some of these signals. 1BCG's signals could have been heard easily 400 feet from the tent. Although we started out to see how far away he could be heard, we gave the idea up because of the rain which was coming down, and because of the time which would have been taken. 1ARY and 2FD (and later 2FP) almost equalled 1BCG as to strength, during one or two very short intervals. 1BDT, a spark station, although by no means as strong, almost equalled 1BCG in steadiness of signals during a long period. Two of the continuous wave stations were using powers of less than 30 watts!

On the following morning (December 12) excellent conditions continued until 3.30. Dozens of stations were going at the same time—a most wonderful procedure considering the distance. Stations logged up to 2.20 are as follows: 3XM, code LXCAM:

1BKA, 1XM, 1BCG, 2EH, 2FP, 2ARY, 2AJW, 1ARY, 1RZ, all C.W., and 1BDT, 3FB, and 2EL, which were spark.

At 2.52 A. M. station 1BCG called and started what proved to be the first message ever sent across the Atlantic via Amateur Radio:

Nr. 1 de 1BCG words 12
New York date Dec. 11, 1921
(12-1921) to Paul Godley,
Ardrossan, Scotland.
Hearty congratulations.

(Signed)
Burghard, Inman, Grinan,
Armstrong, Amy, Cronk-
hite.

Reception of this message was completed at 3 A. M. He said "bi two hours," which was the last heard of him, for, between 3 A. M. and 4 A. M. signals began to fall off rapidly and no readable signals from American amateurs were heard during the remainder of the tests.

Atmospherics grew worse, and continued rapidly worse during the remaining long nights. Summerlike weather began to prevail, winds growing heavier and finally terminating in a cyclone which had swept clear across the Atlantic to wreck shipping on the way, and to cause a tidal wave which backed water up to a depth of two feet in the streets of Hull. We escaped the fury of this storm by dismantling on the late afternoon of the 16th.

On the 19th, when I had reached London. I found that great enthusiasm was being shown as a result of the tests. Station 1BCG had been heard by 5 British amateurs, by a Dutch amateur in Amsterdam, and by an American ship operator in the harbor at Hamburg, Germany, and all newspapers in Belgium, France and the British Isles were featuring the story.

British amateurs had also heard 1AFV, Salem, Mass.: 1UN, Manchester, Mass.: 1RU, Hartford, Conn.; 1XM, Cambridge, Mass.: 2FP, Brooklyn, N. Y.; 2ZL, Valley Stream, L. I. They also report that it is probable that 17E, Marion, Mass., was heard, as well as station 2ZU, whereabouts

unknown. Their report states that C.W. stations only were heard, which eliminates 2ZC whom they logged, since 2ZC is a spark station.

A complete list of stations heard at Ardrossan is as follows:

Spark—1AAW, not yet located; 1ARY, Burlington, Vt.; 1BDT, Atlantic, Mass.; 2BK and 2DN, Yonkers, N. Y.; 2EL, Freeport, L. I.; 3FB, Atlantic City, N. J.; 8BU, Cleveland, Ohio; 9ZJ, Indianapolis, Ind., and 3BP, Newmarket, Ontario.

Continuous wave—1ARY, Burlington, Vt.; 1BCG, Greenwich, Conn.; 1BDT, Atlantic, Mass.; 1BGF, Hartford, Conn.; 1BKA, Glenbrook, Conn.; 1RU, Hartford, Conn.; 1RZ, Ridgefield, Conn.; 1XM, Cambridge, Mass.; 1YK, Worcester, Mass.; 2ARY, Brooklyn, N. Y.; 2AJW, Babylon, L. I.; 2BML, Riverhead, L. I.; 2EH, Riverhead, L. I.; 2FD, New York City; 2FP, Brooklyn, N. Y.; 3DH, Princeton, N. J.; 2ACF, Washington, Pa.; and 8XV, Pittsburg, Pa., with the probability that 4GL, Savannah, Ga., was also heard.

In glancing over the above lists one is struck by the preponderance of the C.W. stations, and by the fact that the British heard C.W. stations only. That can mean only one thing, that C.W. is far superior, and I should like nothing better than to see all amateurs change over to continuous wave at once. Spark methods are horribly out of date, and are so inefficient, comparatively, as to be ridiculous, were it not that many have invested good money in spark equipment. Station 1AFV, since the tests, has gotten three messages across to England (London) on 200 watts of C.W. Many stations of the Atlantic seaboard are reaching to the California coast with similar powers, while the west coast stations have been shoving signals into the Hawaiian Islands. The day is not far distant when amateurs the world over will be exchanging greetings in many languages, and by the same token, the day is almost here when spark stations will be of interest as having to do with history only.

Another Article by Mr. Godley

giving his impressions of radio men and radio methods in England.

will appear in the

APRIL WIRELESS AGE

American Stations Heard by English Amateurs

DURING the recent trans Atlantic amateur tests the following American stations were heard by W. F. Burne, Sale, Cheshire, England, approximately 40 miles from London.

- 2FP, H. C. Barber, 252 Neptune Avenue, Brooklyn, N. Y.
- 2BML, R. B. Bourne, P. O. Box 13, Riverhead, Long Island.
- 2ZL, J. O. Smith, 3 Corona Ave., Valley Stream, Long Island.
- 1BCG, Minton Cronkhite, Greenwich, Conn.
- 1UN, Joseph B. Dodge, 26 School Street, Manchester, Massachusetts.
- 1XM, Massachusetts School of Technology, Cambridge, Mass.
- 1ZE, I. Vermilya, 24 Allen Street, Marion, Mass.

Reception of the first three stations of the above list included the correct code words as well as the calls.

In the case of 1ZE there were one or two errors in the code word which, however, were easily understandable. 1UN and 1XM were in the "free for all" period.

Mr. Burne has been declared the winner of the first prize offered by several British concerns and organizations for having been successful in hearing the greatest number of

American amateur stations. The aerial used by Mr. Burne is an inverted L, supported by one mast on his house and one in an adjoining garden. It is 56 feet high at the house end and 45 feet high at the other. The antenna is within the limited size allowed by the General Post Office, being only 45 feet long. The usual water pipe was used as a ground for the receiving set.

The set used in the record-breaking reception was mostly of home construction. Mr. Burne states that a friend of his classified it as "a glorified collection of junk." **SOME JUNK!**

The set consisted of the usual tuning devices, radio-frequency transformers and condensers, detector and audio-frequency amplifiers. On the first two nights of the tests four ES 4 valves were used, making a total of five with the separate external heterodyne. On the third night five tubes were used as radio-frequency amplifiers, in addition to the heterodyne. On succeeding nights six radio-frequency valves were used, with the occasional addition of one or two steps of audio-frequency amplifiers.

HEARD BY H. H. WHITFIELD

The following stations were heard by H. H. Whitfield, who was awarded the second prize offered by British concerns.

- 1AFV, F. C. Estey, Salem, Mass.
- 1BCG, Greenwich, Conn.
- 2ZL, Valley Stream, Long Island, N. Y.

In the first and third cases the special code signals were correctly received, as well as the the calls.

As in the case of Mr. Burne's station, the receiving apparatus used by Mr. Whitfield was composed of miscellaneous parts, loosely assembled on a table. The apparatus was all home-made, with the exception of condensers, tubes, batteries and head telephones. Six tubes were used. The aerial of Mr. Whitfield's station is composed of two wires, 40 feet high, running east and west, with the lead-in from the east end. The usual water pipe is used as a ground.

HEARD BY W. E. F. CORSHAM AND R. D. SPENCE

W. E. F. Corsham and R. D. Spence were jointly awarded the third prize, each having heard one American station, as follows:

- 1AFV, Salem, Mass. Code group correctly received. Heard by Mr. W. E. F. Corsham.
- 2ZL, Valley Stream, Long Island, N. Y. Code group correctly received. Heard by Mr. R. D. Spence.

(Continued on page 45)

Equipment at 2ZL in Trans-Atlantic Work

THE set used at 2ZL station at Valley Stream, L. I., during the recent trans-Atlantic tests, when signals from the station were heard in England, employed two 250-watt Radiotrons, UV-204, in a self-rectification circuit as shown below.

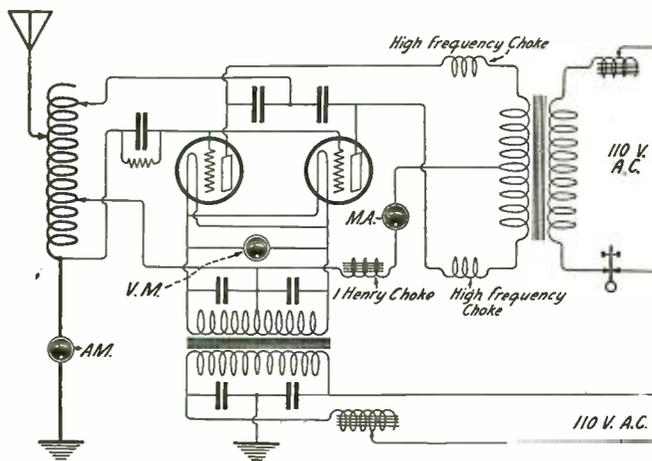
A transformer, with a split secondary, supplies A.C. for plate potential, at 2,200 volts for each tube, 4,400 over all. The filaments of the tubes are heated with A.C., by means of a transformer, also with split secondary.

The value of the grid leak resistance used in shunt to the grid condenser is 20,000 ohms, and the capacity of the grid condenser .002. The antenna at 2ZL is an inverted L, 85 feet high at the end away from the station, and 65 feet high at the station end. The flat top is 120 feet long. The leads, four in number, are from the low end. The fundamental wavelength of the antenna is 210 meters. The antenna points southwest-northeast, with the leads on the southwest end. In view of the fact that the station was heard in England and at Monterey, Calif., at practically the

same time, it seems to indicate that there are no directional effects.

A counterpoise ground system is

the antenna. The resistance of the entire antenna and ground system is 7 ohms and the antenna current is



Circuit diagram of 2ZL Station

used, consisting of 8 wires, on spreaders, directly under the antenna, and fanned out at both ends beyond

normally 8 amperes on 325 meters, representing approximately 450 watts in the antenna.